Statement of Dr. Carolyn L. Huntoon
Assistant Secretary for
Environmental Management
U.S. Department of Energy
Before the
Subcommittee on Energy Research, Development, Production and Regulation
Committee on Energy and Natural Resources
United States Senate

March 31, 2000

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to bring the Subcommittee up to date on the Department of Energy's environmental cleanup program at the Paducah Gaseous Diffusion Plant in Kentucky.

My goal at the Paducah Gaseous Diffusion Plant site is to complete cleanup of the site as expeditiously and cost-effectively as possible. I believe the Department has made significant progress in accelerating cleanup to reduce risks and costs in a manner consistent with my strong commitment to the safety of workers and the general public, and protection of the environment. With the support of the Congress, the Department increased funding for cleanup activities at Paducah in FY 2000, and our FY 2001 budget request of $78 million would increase funding even more – more than double the funding level in FY 1999. With these additional funds, we have accelerated critical activities and plan to accelerate the schedules of other cleanup work. We are working to identify and deploy innovative technologies to maximize dollars we spend on actual cleanup.

I want to be sure that we are addressing site contamination problems in the right priority. The Department is continuing to work with the Commonwealth of Kentucky and the U.S. Environmental Protection Agency (EPA), workers, and local citizens at the site on all aspects of the cleanup, including setting cleanup priorities. We have been working aggressively over the past few months with our State and federal partners to evaluate site cleanup strategies and to identify a path forward that would enable us to accelerate completion of the cleanup at the site.

In my statement to you today, I will describe our progress to date in addressing the cleanup challenges at Paducah. I will also describe the recent actions we have taken to address the concerns raised by DOE's internal investigation of the health and safety conditions at the plant. Finally, I will discuss the work we are doing now and what we plan to accomplish under our FY 2001 request and beyond. Before I move to the specifics of our cleanup work, however, I would like to provide an overview of the Environmental Management (EM) program and the cleanup challenges at the Paducah site.

THE ENVIRONMENTAL MANAGEMENT PROGRAM AT PADUCAH

The 3,500 acre site in Paducah – including 750 acres within the fenced security area and 2,000 acres leased to the Kentucky Department of Fish and Wildlife – is among the Department's

smaller sites. The site is still producing enriched uranium for commercial nuclear reactors. The enrichment operations were privatized in 1993 under the auspices of the U.S. Enrichment Corporation (USEC). USEC, which is a commercial enterprise and therefore regulated by the Nuclear Regulatory Commission (NRC), is responsible for all primary process facilities and auxiliary facilities associated with the enrichment services and for waste generated by current operations. The Department is responsible for facilities, materials, and equipment not needed by USEC for their operations. The cleanup of environmental contamination at the site and management of legacy waste is also DOE's responsibility. The Department will ultimately have primary responsibility for deactivation and decommissioning of the plant when operations cease, just as it now does for the former gaseous diffusion plant at Oak Ridge.

Within the Department, the Office of Environmental Management and the Office of Nuclear Energy, Science and Technology (Nuclear Energy) share responsibility for different aspects of the management and cleanup of the site. Nuclear Energy is the site "landlord." It is responsible for administering the lease of facilities to USEC, storage and maintenance of the cylinders containing depleted uranium hexafluoride at the site, and other landlord functions such as maintenance of roads and fences outside the security area. Nuclear Energy is responsible for surveillance and maintenance of surplus facilities not leased to USEC.

The Office of Environmental Management (EM) bears primary responsibility for cleanup. This includes remediation of environmental contamination caused by releases of hazardous and radioactive materials into the environment from previous operations and disposal practices. EM is responsible for management and disposition of "legacy" waste generated by operations before USEC assumed ownership, as well as scrap metals stored on-site. EM also conducts surveillance and maintenance for two site plants, including ancillary buildings associated with the plants, that have been shut down – the C-410 Feed Materials Plant and the C-340 Metal Reduction Plant – to control releases from the buildings.

The cleanup problems and contaminants we face at Paducah are diverse, and include both on-site and off-site contamination from radioactive and hazardous materials. The environmental problem receiving our earliest and most focused attention has been groundwater contamination, which has contaminated private residential wells. The contaminants are traveling in two plumes in a northeasterly and northwesterly direction, extending off-site approximately one and a half miles toward the Ohio River. We have also recently discovered a smaller plume moving to the southwest that appears not to extend beyond the site boundaries. The primary contaminants in the three groundwater plumes are trichloroethene (TCE) and technetium-99. TCE is an industrial degreasing solvent which was used in large quantities from the early 1960's until 1993 to decontaminate equipment and waste material before disposal. Because of widespread industrial use, TCE is a very common contaminant in groundwater at DOE sites and at private sector and Federal facility sites across the country. Technetium-99 is a beta-emitting radionuclide and a fission by-product, introduced into the plant as part of the Reactor Tails Enrichment Program that ran from 1953 to 1975.

There are also numerous contaminated areas around the site where chemical wastes, such as polychlorinated biphenyls (PCBs) used in electrical transformers; radioactive wastes or trace amounts of plutonium and other transuranics (elements with atomic numbers greater than uranium), were disposed of or inadvertently spilled or otherwise released to the environment. Contamination has migrated to or threatens surrounding soils, groundwater, creeks and ditches. There are also 6,000 cubic meters of low level waste in drums, much of which is currently stored outdoors and must be prepared and shipped for disposal. We must also manage and remove about 60,000 tons of scrap metal. These scrap piles act as potential sources of contamination that migrate to the surrounding soils and surface waters. In addition, the piles are located on closed disposal units that need to be characterized and possibly remediated.

Cleanup of the Paducah site continues to be carried out under the direction of Federal and State regulatory agencies. The first regulatory vehicle was a consent order with EPA issued in 1988 to cover initial groundwater measures to address drinking well contamination and characterization of the plumes. The Paducah site was listed on Superfund's National Priorities List in 1994 and, in 1998, DOE, the Commonwealth of Kentucky and EPA signed a Federal Facilities Agreement that provides the framework for cleanup, establishes priorities and enforceable milestones, and integrates cleanup requirements. We carry out our work in accordance with this agreement, the hazardous waste permit under the Resource Conservation and Recovery Act, and other environmental laws. We also manage radioactive materials in accordance with the Atomic Energy Act (AEA), and the DOE rules and orders that implement the Department's AEA responsibilities.

Beginning with door-to-door outreach to local residents when contamination was first discovered in residential wells in 1988, the Department continues to work with the local community to provide information and hear their concerns on contamination problems and the site cleanup actions and priorities. DOE has held periodic public meetings since 1989 to keep residents informed of contamination problems and cleanup progress. It has also supported several advisory groups, including a Neighborhood Council of plant neighbors that provided input to DOE, and later to USEC, in the early 1990s. The Site Specific Advisory Board, formed in 1996, now serves as a primary vehicle for two-way communication on the cleanup with the local community.

ENSURING SAFETY AND HEALTH AT THE PLANT

My first priority as Assistant Secretary for the Environmental Management (EM) program is safety – safety of the contractor and Federal workers that run our facilities and of the public in the communities around our sites is paramount. Accordingly, I would like to first discuss our progress in addressing the specific concerns identified in the Phase I investigation conducted in August 1999 by DOE's Office of Environment, Safety and Health (EH). The Phase I investigation, initiated by the Secretary in response to concerns about worker health and safety, focused on issues from the past ten years and the adequacy of protection provided to workers, the public and the environment today. In addition to examining radiological protection programs, the

team also examined environmental conditions and the environmental protection program. A final Phase I report was issued in October 1999. The Phase II report, which examined historical practices at the Plant, was released in January 2000.

While the investigation team concluded that "current operations do not pose an immediate risk to workers or the public," the report noted a number of weaknesses in the program where improvements were needed. The findings generally concerned the discipline, formality and rigor of the radiation protection programs at the site; deficiencies in the worker safety and health practices and controls; and the level of progress in actual cleanup and remediation of contamination sources, including the level of funding that was available for cleanup work. The team also raised concerns about the effectiveness of DOE oversight of environment, safety and health programs and of DOE's ability to ensure the contractor and its subcontractors were fully implementing DOE and regulatory requirements. The Phase I report identified 14 significant issues that apply to the responsibilities of the Environmental Management and Nuclear Energy programs and to the contractor, Bechtel Jacobs Company.

The Department completed a corrective action plan in December 1999 that laid out the proposed plan of action and schedule to address the issues identified in the Phase I Report. The Corrective Action Plan identified a total of 77 specific actions to address the findings. More than 50 percent of these actions have already been completed.

We have taken corrective actions to address issues associated with our radiation protection programs and worker safety. For example, we made changes to improve the sign postings for radioactively-contaminated areas on DOE property, posting, for example, signs on both sides of the North-South Diversion Ditch, and at several outfall ditches and culverts associated with Little Bayou Creek. This work was completed last fall. We have also made improvements to worker training programs. For example, the training materials were expanded to include more information on transuranic contaminants to ensure workers were informed of the hazards and protection requirements for these materials.

The contractor, Bechtel Jacobs Company, conducted a top-to-bottom review of the radiation control programs at the three gaseous diffusion plants to ensure the controls and procedures are in compliance with DOE requirements and are being fully implemented. The review of both the programmatic elements and field implementation of the Paducah radiation control program was completed in October 1999. The review did not identify any major issues, but resulted in a number of recommendations to strengthen the program, which were incorporated into the corrective action plan. For example, work permits have been tailored to be more specific to the work area, and specify training requirements and the anticipated radiological conditions that will be encountered. As a result of the EH investigation, the contractor has reviewed and revised procedures and worker training for conducting all aspects of radiation control, in some cases implementing more conservative requirements.

The Department has taken steps to address concerns about the effectiveness of DOE

oversight and management of environmental, safety and health programs. To improve the resources and capability at Paducah, the Department has assigned two full-time Federal employees to Paducah as facility representatives. The facility representatives are responsible for monitoring the safety performance of the facility and its operations, and serve as the primary point of contact with the contractor. We have also established an additional Health Physicist position and are in the process of selecting a suitable candidate.

We have acted aggressively to address issues about the pace and effectiveness of the environmental cleanup of the Paducah site. Noting funding constraints, the investigation raised concerns about the progress in controlling and remediating groundwater contamination, in eliminating the potential contamination sources such as scrap metal piles and stored low-level waste, and in addressing the shutdown process support buildings. As discussed below in this testimony, the Department has requested significant increases in the level of funding for cleanup activities to accelerate the pace of cleanup. For example, with the $6 million in additional funding provided for FY 2000, we are accelerating the removal of Drum Mountain and plan to complete removal of the drums a year ahead of the previous schedule. Our budget requests for FY 2001 and a supplemental request for FY 2000 will allow for further acceleration of environmental cleanup. I will discuss the activities supported by our requests, but first want to describe what has already been achieved.

CLEANING UP CONTAMINATION AT PADUCAH: THE MOST IMMEDIATE OFF-SITE THREATS HAVE BEEN ADDRESSED

Our cleanup strategy is risk-driven. Our highest priority has been to address the most immediate threats to the public from off-site contamination. We have also focused on identifying and eliminating the "hot spots" and other suspected sources of off-site contamination. And we have worked to characterize the site and analyze solutions to develop a sound technical basis for long-term action and to ensure our workers doing the cleanup are safe. This strategy and our priorities for action have been developed in conjunction with our State and EPA regulators and others with concerns at the site, and are incorporated into our cleanup agreements. With the State and EPA, we have worked to set priorities for the available funding each year to ensure it is used to address the highest risks and to support long-term cleanup.

We have successfully completed actions to address the most immediate off-site risk, specifically the threat posed by the contamination of off-site residential wells from contaminated groundwater. Upon discovery of contaminated wells near the Paducah plant in 1988, the Department immediately provided bottled water to the residents whose wells were contaminated and began sampling nearby residential wells and monitoring wells to determine the extent of contamination, ultimately sampling about 400 off-site wells. The sampling results indicated TCE concentrations in six residential wells were greater than the EPA drinking water standards of five parts per billion. The Department put in place a residential well sampling program, and entered into an Administrative Consent Order with EPA to investigate thoroughly the source of contamination and take appropriate actions.

After completing the groundwater investigations, the Department, working with the municipal authorities, funded the extension of 12 miles of municipal water supply line to over 100 residences and businesses whose wells were contaminated. We are also paying their water bills. Through our characterization efforts, the Department has also identified the areas of the plumes with the highest concentrations of contaminants and has installed groundwater pump and treat systems in each plume to contain the spread and treat these higher contaminant concentrations. These treatment systems, installed in the Northwest plume in 1995 and in the Northeast plume in 1997, have already treated about 600 million gallons of contaminated groundwater. Monitoring data show that these systems are successfully containing the spread of these high concentration areas.

While we have addressed the most urgent risk to the public from the groundwater plumes, we continue to sample groundwater on a routine basis using a monitoring network of some 165 residential and other wells installed to track contaminant migration.

WE HAVE TAKEN INTERIM ACTIONS TO MITIGATE OFF-SITE CONTAMINATION SOURCES

The second prong of our cleanup strategy has been to characterize contamination at the site and control "hot-spots" and other suspected sources of off-site contamination. We have made progress with these efforts. We have:

- removed 162 cubic yards of contaminated soil from areas that have high concentrations of contaminants;
- taken several steps to reduce potential contamination associated with the North-South Diversion Ditch, where the highest levels of plutonium and uranium were found. We have installed a treatment system for effluents from the C-400 Cleaning Building to reduce concentrations before discharge, and have installed an approximately 1300-foot piping system that bypasses about half the length of the ditch to reduce the potential for sediment contamination;
- closed nine leaking underground storage tanks that stored petroleum products or cleaning solvents which were found to be contaminating soils and potentially groundwater;
- excavated about 60 cubic yards of contaminated soils from a concrete rubble pile located in the Ballard County Wildlife Area;
- installed an impermeable cap over the uranium burial ground and enhanced the existing cap on a sanitary landfill to reduce leachate migration from rainfall infiltration;
- closed on-site low-level waste burial grounds and waste storage areas;
- installed sediment controls at the scrap yards and drainage ditches to mitigate surface water and sediment runoff; and
- installed institutional controls for off-site contamination in surface water, outfalls, and lagoons.

Most of our "on-the-ground" cleanup actions to date have been directed toward eliminating immediate risks and contamination hot spots, particularly those contributing to off-site contamination. We have, for the most part, accomplished that objective, and site priorities are now shifting to cleanup of on-site sources contributing to groundwater and surface water contamination, and to long-term cleanup remedies.

In addition, like any other complex cleanup project, much of our work to date has been directed toward the characterization and assessment of the contamination at the site, providing the information necessary to identify and prioritize cleanup activities and to devise sound technical solutions. While less dramatic than actual cleanup, this work is a critical step in cleanup. Because of the hazardous nature of the contaminants and the processes involved in cleanup, characterization is also a critical step in protecting the workers who are doing the cleanup. Although there is more characterization and analysis to be done, our efforts will increasingly shift to actual cleanup, making use of the data and information that has been developed.

ACCELERATING CLEANUP OF PADUCAH

The Department is accelerating our cleanup efforts at Paducah and has requested funding at a level that will significantly increase the funds available for cleanup activities. In fact, the FY 2001 request of $78 million will essentially double the funding for cleanup at Paducah compared to FY 1999 levels. The FY 2001 request also meets the recommendations in the Conference Report for the FY 2000 Energy and Water Development Appropriations Act to substantially increase funding for cleanup of these two sites. Cleanup activities at the Paducah site received about $36 million in FY 1999 and $43.5 million in FY 2000. The funding in FY 2000 includes $6 million from the additional funding appropriated for cleanup activities at the gaseous diffusion plants in response to the budget amendment. The Department has also submitted a supplemental budget request to Congress for FY 2000 funding that would provide an additional $8 million for cleanup activities at the Paducah site. These additional funds will enable us to accelerate cleanup and tackle some of the biggest concerns of the local community and concerns raised in the EH report.

In November 1999, senior managers from DOE, the Commonwealth of Kentucky, and the U. S. Environmental Protection Agency chartered a Tri-Party Working Group to review the Paducah cleanup program and overall site priorities, and identify opportunities for acceleration by taking early actions and streamlining the regulatory review process. The working group agreed that the fundamental site strategy is technically sound, but concluded that there are opportunities to accelerate existing schedules to address principal potential sources of contamination. The Department is continuing to work with the Tri-Party Working Group to develop a life-cycle baseline that would detail the schedule, scope, and estimated cost to accelerate overall site completion from the current baseline of 2012 to 2010. These proposed enhancements to the current cleanup strategy would provide the framework for accelerating site cleanup in an efficient and cost-effective manner.

In FY 2000, we will accelerate the removal and disposal of "Drum Mountain," a large scrap pile containing thousands of drums, which is a suspected source of contamination of the Big and Little Bayou Creeks from surface run-off. The additional funds provided by Congress in the FY 2000 appropriation will enable us to remove Drum Mountain by the end of this fiscal year and complete disposal of the packaged waste in December 2000, a year earlier than previously planned. This project will allow us to remove a major impediment to characterizing the burial ground as well as eliminate a potential contamination source. The contract to remove the drums has been awarded and field work will begin in May.

The activities in FY 2000 illustrate the shift from the focus on immediate risks and interim actions to the next phase of cleanup. Our groundwater cleanup activities this fiscal year include the start of operation of an innovative treatment technology, referred to as the "Lasagna" technology, to treat TCE-contaminated soil. Named for the layered "treatment zones" in the subsurface soil, the Lasagna process generates an electric field and uses chemical means to destroy the TCE. Lasagna technology became fully operational in December 1999 and is being used to remediate shallow soils in the former Cylinder Drop Test Area, a major source of TCE contamination in groundwater. We expect to complete TCE removal in this Test Area in FY 2001.

We will also conduct a treatability study for the Southwest plume to evaluate an innovative in-situ groundwater technology, called a Permeable Treatment Zone, that involves the construction of a reactive subsurface wall to remove contaminants. We will also continue "pump-and-treat" systems in the Northeast and Northwest plumes, and make progress on evaluation and selection of a final remedy for the groundwater plumes.

One of my priorities is to bring the best science and technology to bear on solving the cleanup challenges facing the Department. I have formed a Technology Deployment Assistance Team at Headquarters to help the sites identify innovative technologies that can solve cleanup problems in a more efficient and less costly manner. I plan to couple this effort with ongoing efforts to accelerate technology deployments across DOE sites. In November 1999, I directed a Technology Deployment Assistance Team that included scientists from each of the national laboratories to work with the Paducah site and build on ongoing technology program efforts to identify innovative technologies for characterizing, monitoring, and remediating groundwater plumes. The Team recommended various promising technologies that should be considered for the Paducah cleanup, including vapor and liquid extraction systems for mass removal, chemical oxidation, bioremediation, and permeable treatment zones. The latter technology is already scheduled for a field scale demonstration in FY 2000, and plans are being developed to test several of the other technologies recommended by the Team in FY 2001. These new technologies, if successful, may prove to be considerably more efficient and effective than the existing groundwater pump-and-treat systems.

The Department submitted a supplemental budget request for FY 2000 that included an additional $8M at Paducah that would enable us to address several of the high priority items

identified by DOE-EH investigation. These funds would be used to remove concrete rubble piles on the West Kentucky Wildlife Management Area, one of which was found in the investigation to have low-levels of radiological contamination. The funds would support removal of contaminated equipment from the two shut down buildings, and initiating the characterization and removal of the large inventory of low level wastes that is currently stored outdoors.

The FY 2001 request enables us to continue accelerating disposition of the remaining 57,500 tons of contaminated scrap metal stored in outside storage areas on a pace for completion by FY 2003, allowing characterization of the ground underneath the piles. We will also continue stabilization activities in the two shut down buildings; characterize and dispose of the remaining 9,000 drums of low-level radioactive waste, some of which are currently stored in deteriorating drums; and ship 2,000 drums of mixed waste to an off-site disposal facility. We will also issue the record of decision for the final groundwater remedy and begin remedial design, accelerate the surface water investigation, and finalize the decision and begin remedial design for cleaning up the North-South Diversion Ditch.

CONCLUSION

We are making progress at Paducah. Like all of our sites, the problems at Paducah are complex, significant in scale, technically difficult, and will take time to correct. We will continue to evaluate what resources are needed to complete the corrective actions and accelerate cleanup activities to address concerns raised by current and former workers and by the investigation team.

I will not allow the safety of our workers, the public, or the environment to be knowingly compromised. My first priority for EM is safety – safety of the contractor and Federal workers, and of the people in the communities around our sites. I will hold my managers accountable for ensuring that workers and the public are protected.